Hobbies WEEKLY

September 28th, 1949 | Price Threepence | Vol. 108 No. 2813

CONTENTS

A novel model to make is this

OLD TIME CAB

WHILE old-time Galleons have proved so popular with our model makers, it must be said that ancient war weapons and vehicles of by-gone days are becoming increasingly popular, too. Today, it is comparatively an easy matter to get first-hand information regarding these things, and models and details to help the modeller can be seen at most of the museums in London and elsewhere. He has almost a free hand, too, in making measured sketches of almost anything he desires to copy and reproduce as a first-class scale model.

Patterns Provided

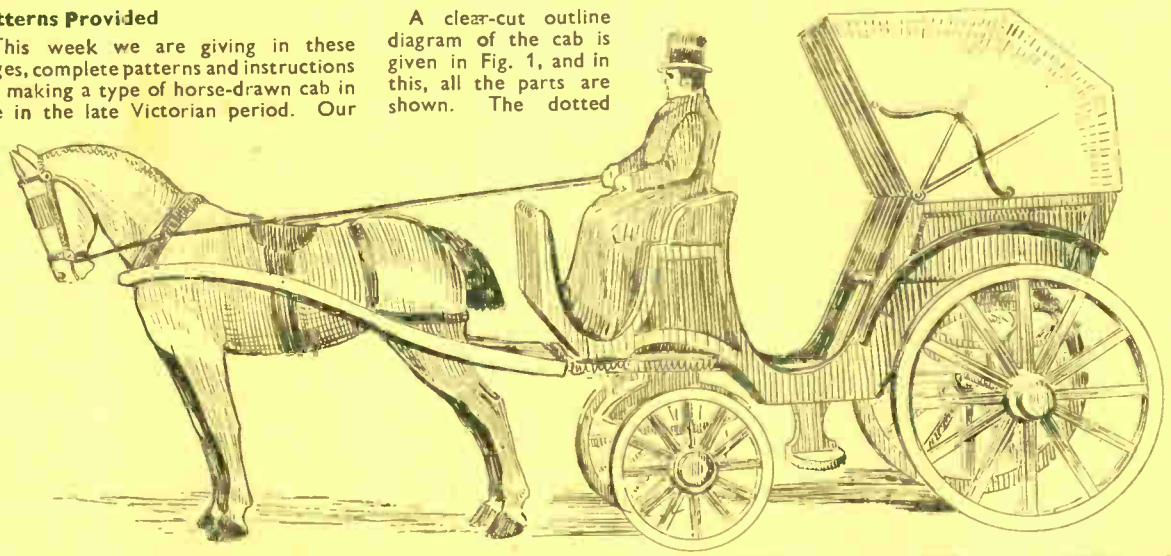
This week we are giving in these pages, complete patterns and instructions for making a type of horse-drawn cab in use in the late Victorian period. Our model is nearly 10in. long and stands 4½in. high. We have kept, perhaps, to the strict appearance of both cab and horse in our illustration by not showing a base or stand for the model. Most workers will, of course, provide a suitable stand so the whole can be lifted.

Wood, ⅛in. thick is used for the whole of the cab, and the only thicker wood required is in the make-up of the horse, where 3/16in. stuff is used for the legs and ¼in. for the body. The combined thickness of ¾in. is essential for the carving and shaping.

The Cab

A clear-cut outline diagram of the cab is given in Fig. 1, and in this, all the parts are shown. The dotted lines distinctly indicate those parts which, provide the width of the vehicle. Full-size patterns on page 311 are of all those parts which would be difficult to enlarge from a smaller diagram.

The first parts to cut will be the sides (A) of the patterns. Stick down or trace out this pattern, therefore, to a piece of ⅛in. wood. Then pin another layer of ⅛in. stuff to it, two can be cut to outline with the one cutting. This ensures the two sides being identical, a very necessary precaution where such a model as this is concerned. After cutting the double thickness, the two sides should drop from the waste wood,



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when they can be cleaned very carefully with fine glasspaper.

Lay the two pieces aside, and proceed with all the cross pieces lettered in the diagram as (B) right on to letter (L). All these will be of one width, of course, 1⅝in., and run from one side of the model to the other, as the detail, Fig. 1, shows. The best way of getting the lengths of the pieces will be to measure each off from the full size pattern of the side, but as some workers may prefer to have the actual lengths given them, we include them here for easy reference. They are—(B) 1in., (C) 1⅝in., (D) ⅞in., (E) ⅛in., (F) 1⅛in., (G) ⅞in., (H) 1⅛in., (I) 1in., (J) 1⅛in., (K) ⅜in., (L) 1in.

Cut each piece to the measurements given. Then lay them endways upon the pattern before it is cleaned off the wood and note the chamfer. Lines are then drawn across the widths of the piece so that a true guide is made for filing to the correct chamfer.

Sprigs and Springs

Now glue all the parts in place, to one side, getting them all to stand at right angles. Then apply glue to the free ends of the pieces and carefully add the second side. When the glue has set hard, make tiny, almost pin-prick holes, in the sides where the uprights come, and drive in the smallest sprigs obtainable. Just the points of common pins cut with the wire-cutting pliers about 3/16in. long will be found admirable for the job.

and (R). Two of each letter will be wanted.

The shafts for the horse consist of the two parts (S) and (T) and both are given on the pattern sheet. Cut two of piece (T) and glue them as detail, Fig. 4 shows. Run in two small brass eyelets to engage the corresponding hooks on the front of piece (P) (see Figs. 3 and 2). Round off the shafts (T) before attaching them to (S).

The Wheels

Now proceed with the wheels. Two of each of those on the pattern sheet will be wanted, and they may be cut in duplicate in a similar manner to the two sides of the cab. To make a really perfect model, the spokes of the wheels should each receive individual attention, and be shaped almost circular where they meet the outer rims of the wheels (see Fig. 5). Next cut eight washers as (U) on the pattern sheet, and glue them in pairs one each side of the wheel to form a substantial hub.

The wheels are to be put on later with long fine countersunk screws, the heads being let in flush on the washers (U) to allow the tiny cover cap discs (V) to glue on as a finish to the hubs.

Before the wheels are attached, the hood to the cab should be made in three pieces from stout card. On the pattern sheet is given the outline of one side, and two of these are wanted. Then, round the outside, the third covering piece measuring 3⅜in. long by 1 1/16in. wide is glued to the gluing tabs of the side, as shown on the pattern. The

should be allowed at the commencement of operations, it being easier to cut away than it is to add.

We have allowed sufficient layers for the make-up of the horse by having the body or middle section ⅜in. thick and the two leg or side sections 3/16in. thick. On the pattern sheet full-size outlines are given for the legs and the body. Cut one of the head and body ⅜in. thick, and two of the leg section, noting the direction of grain of wood. Glue them together and cramp them as usual. For the shaping and trimming away of the wood a sharp pocket knife is quite good.

To preserve a sharp edge on a blade the writer has found that a piece of ¼in. wood about 6in. long and 1½in. wide, with emery paper of two grades glued to it answers admirably for carving. This knife, with a rasp and file and some glasspaper should be all the tools required.

For the driver two pieces of ⅜in. wood are cut to the outline shown on the pattern sheet and glued together for the head and body. The two arms are to be glued on, one either side of the body when the latter has received the preliminary carving to get the first effects of complete figure outline. All the carving will be done in a similar manner to the horse, and both figures will be painted realistically.

Fixing the Horse

The horse will be held in the shafts by screws running through at the points shown on the pattern, while the feet will be touched with glue to hold them securely in place on the base.

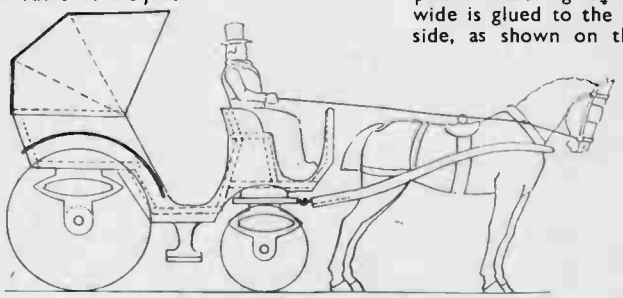


Fig. 1—Side elevation with adjoining parts shown dotted

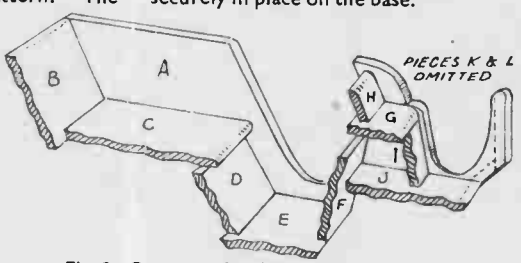


Fig. 2—Cut-away showing crosspieces lettered

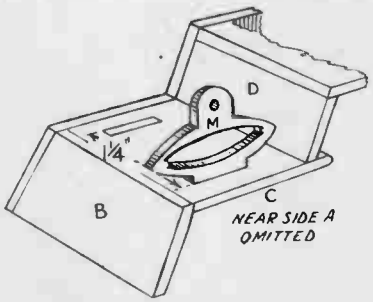


Fig. 3—Underview of spring

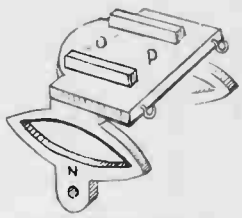


Fig. 4—Front springs

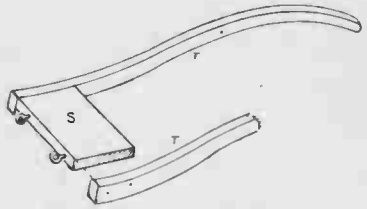


Fig. 5—Shafts and joining piece

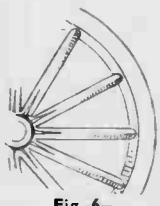


Fig. 6—Wheel shaping

Two each of the springs (M) and (N) are next cut and glued to the underside of pieces (C) and (P) respectively (see details, Figs. 2 and 3). Piece (P) forms the undercarriage beneath the driver's seat, the two little cross pieces (O) making the connection with the floor piece (J) of the carriage. The side view, Fig. 2, shows these parts plainly. The step leading into the cab is made of the two parts (Q)

completed hood is glued to the top outside surfaces of the sides of the cab as indicated by the dotted lines on the pattern sheet. It would be best to stain or paint the inside of the hood before it is fixed to the cab.

The attractiveness of the whole model is increased by the addition of a driver and horse. Special care must be given to the shaping of the parts to get a realistic effect. Full instructions cannot be given here but by careful study and forethought reasonably life-like figures can be made. Ample wood thicknesses

The base for the model should measure at least 10in. by 4in., and should be built up for sake of good appearance in two thicknesses of wood, ⅜in. wood with rounded edges for the lower member, with ⅛in. overlay, say, 9½in. by 3½in. for the top. French polish or paint will make a suitable finish to the base. Coaches and cabs of this early period were gaily painted. Most of the cab should be black with side panels as indicated of dark maroon or indian red lined in chrome. If mudguards of stiff paper are added these should be black.

The first of a short and practical series all about

HAND PUPPETS

TO most people the hand-puppet is best known by those world-renowned actors, the stars of the roadside theatre, Punch and Judy. They are the traditional English glove puppets. Mr. Punch, however, is but one member of a very ancient, very large, and wide-spread family. He is related to Guignol of France, to Kasperl of Germany, to Karaghoz, the shadow 'punch' of Turkey.

In other parts of Europe, particularly in Soviet Russia the art of the hand-puppet has reached a high degree of perfection. So that our hand-puppets have not only a long pedigree, but a universality, too.

Perhaps it is because they are so easy to make and manipulate that hand-puppets have had such a long life, and such popularity. In a way they might be called 'pocket entertainers' for they can be packed in so small a space that they can be actually carried about in a jacket pocket—an ever-ready show.

They are so easily handled that children can operate them without any trouble and with but little practice. The little, soft, furry, monkeys puppets sold in toy shops as playthings are really hand-puppets, and very good ones, too.

In Four Parts

Undressed, the hand-puppet consists of four parts—the head, two hands, and a foundation body or sleeve, with very short arms. When these four pieces are joined together the puppet is, in effect, complete (see Fig. 1). Clothing and make-up are additional details used to express type and character.

To manipulate the puppet the hand and forearm is put up inside the sleeve. The index finger goes into the tubular neck, and the thumb and second finger go into the 'thimbles' attached to the hands. That is all; the rest depends on the skill and dramatic powers of the operator.

In a later article the hand-puppet stage will be described in detail, but the enthusiastic beginner in the art need not be inactive because of the lack of a stage. A hand-puppet show can be given anywhere, over a garden wall, from behind a screen, or over a curtain stretched across a doorway, or over a bed-rail.

Practical Work

There are certain important points which should be borne in mind when making finger-operated heads. First, they must be strongly made, secondly, light in weight, and thirdly, they should be of a size and proportion which can be seen quite distinctly by the back rows of the audience.

Taking these points into consideration a strongly made head, if it is to be for a knockabout, comic character must be made of wood. Hardwood should be used, one which will carve well and not be too inclined to split, by reason of hard knocks.

Yellow pine is very good for broad details. If a block of sufficient size for a whole head is not available the head may be made in two parts, with a hard-wood face, and ordinary pine back.

Independent Features

Outstanding features like Punch's nose and chin should be made separately and plugged into the face (see Fig. 2). Simple heads, without a lot of detail can be made by using wooden balls, or cuts from a round wooden pole. In every case the finger tube should be made through the neck before any detailed carving is attempted. This tube should not be more than 1in. in diameter (see Fig. 3).

There are no hard and fast rules in this form of puppetry for effects may be obtained by any means. If the show is good the audience will enjoy it just as much if the heads of the puppets are made of old tennis balls as they would if carved in wood by a master sculptor.

Solid wooden heads may be a little on the heavy side especially for children's use, so for general use of a non vigorous nature strongly made heads of papier-mâché will serve quite as well.

Two Forms of Making

There are two main methods of making these paper heads. One is to make a clay or Plasticine model of the head. Then cut it, vertically, into two pieces; usually the cut is at the back of the ears. Lay the two pieces on a sheet of glass and put a 'box' or wall of clay around them, make the wall about 1in. higher than the thickest part of the patterns.

Lay over all a thin coating of oil or Vaseline, then pour in a solution of superfine plaster of paris until it reaches the top level of the surrounding wall. Let this set completely before removing the wall and the glass base. Dig out the clay or Plasticine very carefully and the mould is ready for use. The process is seen in stages in Fig. 4.

The papier-mâché head is made by putting into the mould layers of paper well covered with ordinary flour paste. The pulp is pressed well into the pattern, and there should be about nine definite layers of paper, all well dried and set in the mould before the mask and back section are removed.

When the two halves are free from the mould they are joined together by a band of linen, and additional layers of paper are then pasted over the join.

(*Continued foot of page 304*)

Fig. 1—The four parts being manipulated

Fig. 2 — Plugging nose and chin

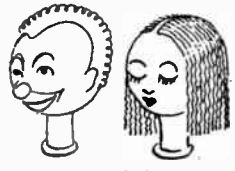


Fig. 3—Ball heads on card tubes

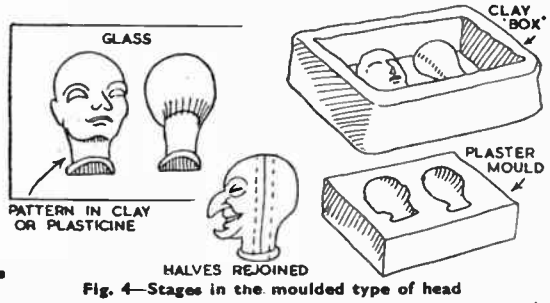


Fig. 4—Stages in the moulded type of head

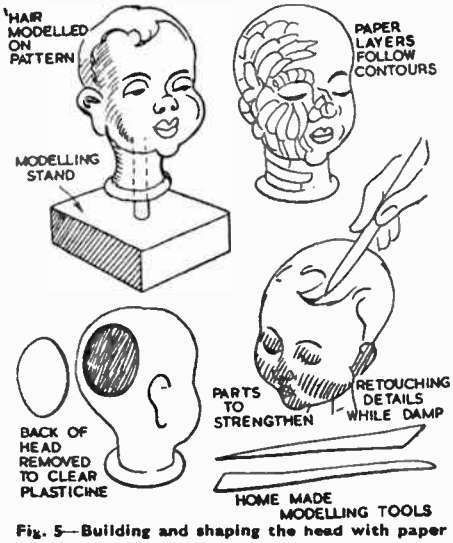
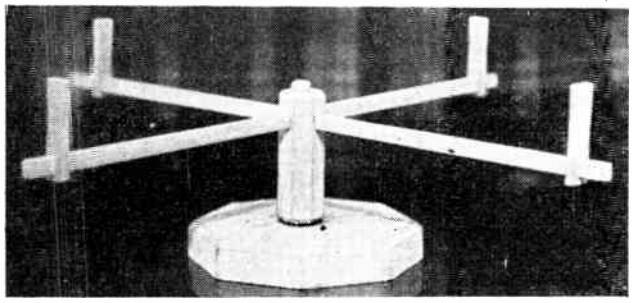


Fig. 5—Building and shaping the head with paper

Any lady would be delighted if you gave her
A WOOL WINDER

THE novel skein winder illustrated is extremely useful for winding skeined wool, as it does this rather irksome task far more efficiently and in a fraction of the time normally taken. Its method of operation is quite simple. The skein of wool is placed over the adjustable supports which are then located to hold the skein securely in position. When the winding is commenced, the apparatus, which is mounted on ball-bearings, revolves without any effort, and quickly and easily completes the 'balling' of the wool.



Use Good Wood

Although the winder can be constructed from almost any kind of wood, oak is preferable, being strong and substantial and giving a nice finished appearance upon completion. The baseboard is made from a 6in. square of wood, not less than 1in. thick. It can be left square in shape or octangular as desired. The baseboard should be glasspapered as smooth as possible, and a piece of felt glued to the underside to prevent the winder from slipping on polished surfaces when in use.

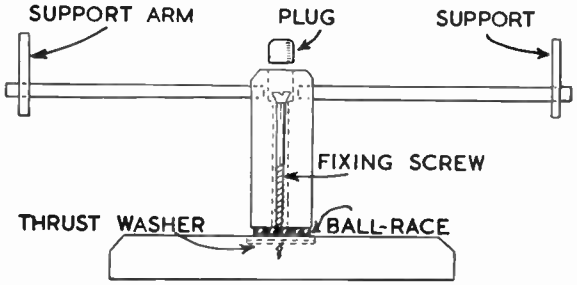


Fig. 1—Sectional view showing parts in place

The column is constructed from a piece of 4in. by 1½in. square wood. If desired, this can be made into an octagon shape which considerably improves the finished appearance of the article. A $\frac{5}{16}$in. hole is drilled lengthwise down the column, with a countersunk hole ½in. diameter by ¾in. depth made in one end to take the fixing screw. A further hole, 1in. diameter by ¼in. depth is drilled in the other end of the column to take the ball-race.

At the top end of the column make four slots, ¼in. by ½in. diametrically opposed, into which fit the skein support arms. The column is now mounted on the baseboard by inserting the ball-race into the end and held down with 4in. screws, as seen in the section at Fig. 1. A suitable ball-bearing can be purchased from a cycle shop. A steel washer should be counter-sunk into the baseboard as a bearing for the ball-race. Do not overtighten the screw, otherwise the action of the winder will be stiff and sluggish.

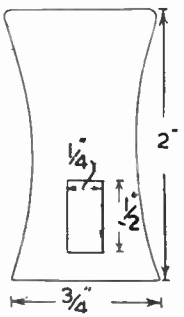


Fig. 2 — The support uprights

The Arms

The four support arms are made from wood, 10in. by ¼in. by ½in., glued securely into the slots in the column. Take care that the ends of the support arms do not protrude through into the hole drilled down the centre of the column, otherwise it will be impossible to adjust the holding-down screw if required.

The adjustable supports are made from four pieces of wood, ¾in. width by 2in. length by ¼in. thickness, and shaped as shown in the illustration at Fig. 2. A slot is made, ½in. by ½in. in the middle of each support, which is then pushed on to the ends of the arms. The supports must be a tight fit on the arms, otherwise they will slip along in use, and spoil the winding. The supports should, of course, be glasspapered as smooth as possible to prevent any possibility of the wool being caught up on a rough edge.

Finish

A small plug or cap is made for the fixing screw hole at the top of the column, and this completes the work. The finish of the winder is best left to the reader's discretion. If the construction has been made in oak, a waxed finish is very attractive, and has the merit of being easily renewed.

A waxed finish is obtained by melting beeswax in warm turpentine or turps substitute, until it has the consistency of thick cream. This is then rubbed well into the surface of the wood, allowed to dry, then well rubbed up with a soft cloth.

Puppets—*(Continued from page 303)*

It will be seen that in each case the head and neck are in one piece and that there is a ridge around the base of the neck to help in fixing on the foundation body.

In all clay or Plasticine modelling for papier-mâché details should be slightly exaggerated to allow for a slight loss in form which occurs through the thickness of the papier-mâché. Lines of character can be accentuated while the mask is not quite dry. This, however, applies more definitely to the heads made by the second method here described.

In this method the principles are reversed. This system is, in a way, more simple and direct, but actually it takes quite as long to do, and it has the disadvantage that only *one* head can be made from the pattern. With the mould system a dozen heads can be produced.

The pattern head is moulded in Plasticine, not clay. The details, nose, eyebrows, etc., are exaggerated to allow for loss, but the head is not cut in half, as for the moulding system. Instead it is stuck on to a modelling stand which consists of a block of wood through which is driven a 4in. nail.

Over this pattern head are pasted at least eight layers of torn pieces of tissue paper, and between the third and fourth layers, there is one of small bits of fine linen to add to the strength of the head. These paper pieces cover the whole head and each layer should be allowed to dry before the next is added. The back of the head can be built up with small newspaper pieces as there are no details to be lost. The process is shown in the details of Fig. 5.

When all the layers are on and dry the back of the head is cut away very carefully and the Plasticine is removed. It should come away quite easily if slightly warmed.

Then the weak points of the face, nose, eyes, mouth and chin can be built up and strengthened inside the head with plastic wood. After this the piece taken from the back of the head is replaced, and a few layers of paper pasted over the join and the head is ready for its wig and make-up.

(To be continued)

Here are practical hints for the handyman who undertakes

HOME PAINTING

MANY readers like to do themselves such painting as may be necessary to their homes. There is nothing difficult about such work, but to get the best results certain rules should be followed. Some hints to this effect may not be unwelcome.

The question of whether it is better to buy the paint ready made, or mix it oneself, often arises. Frankly, the difficulties of obtaining the ingredients, rather urges the easier method of buying it already made up, but if a special colour is required, then home mixing is unavoidable, unless, of course, one gets the shop to mix it.

Mixing

For home mixing, always make up enough to complete the job, as it will be difficult to mix a second supply to the same shade. A pound of good quality paint should cover up to 50 sq. ft. of surface, so the quantity required is just a matter of calculation.

White lead and pigments can be bought ready ground in oil, and can be made into paint with the addition of 1oz. paste driers to each pound, mixed to a workable consistency with linseed oil and turpentine, in equal quantities. Using liquid driers, ½oz. to each pound of paint will be required, ready mixed paint, not dry.

The paint should be strained before use. It works ever so much better, in fact, flows on like butter. If a proper strainer is not to hand, a handy substitute can be made with an empty tin, the bottom of the tin being cut away and a piece of coarse canvas or sacking stretched across.

If a flat colour is required, that is one with a matt not glossy surface, use more turpentine than oil. For a glossy surface, a little clear varnish can be added.

For a priming colour, use white lead, ground in oil, with sufficient red lead to colour it, and thinned well down, with the addition of driers, of course. This should always be used as a first coat to new wood.

Preparation before Painting

Before commencing to paint, the surface must be prepared. If the wood has only been painted once before, it is not really necessary to remove the paint, but it should be rubbed down smooth with pumice stone. This is far preferable to glasspaper, as the latter gets clogged up and useless quickly. Lump pumice stone can be used. It is kept wet, and rubbed over the paintwork. Use water freely to assist the work. Wash off, and when dry, the paint can be applied.

Good results cannot be obtained if new paint is applied to work that is already thickly coated with successive applications of colour. The old stuff should be removed, either with a blowlamp or proprietary paint remover.

Some skill and a lot of care is necessary with the blowlamp, so the amateur is better advised to use a paint remover. The question is often asked how to make up a paint remover for oneself. It is far better not to try, as the ingredients are messy, and not without some danger to the skin and clothes. It is always wiser to buy the made-up article, which can be got from paint and hardware shops.

When painting new wood, coat all knots with patent knotting beforehand—this is rather important, then apply the priming coat. Stop up all cracks and nail holes with a stopping knife, and a paste of putty and white lead, mixed together. Rub down lightly, then apply the undercoat. Over this the finishing coats of paint or varnish paint can be applied.

Application Tips

Method in painting is important, it means all the difference between good finish and indifferent work. It is a mistake, to overload the paint brush, for example it should be charged with paint, and the surplus removed by drawing the brush over a wire, stretched across the paint pot (the best way) or across the edge of the pot itself.

Painting a large surface, a wall for example, a good method is to commence by painting a triangular patch at the top left corner, followed with similar patches until the bottom is reached, and then repeating this from top to bottom, in strips as it were, until the surface is covered.

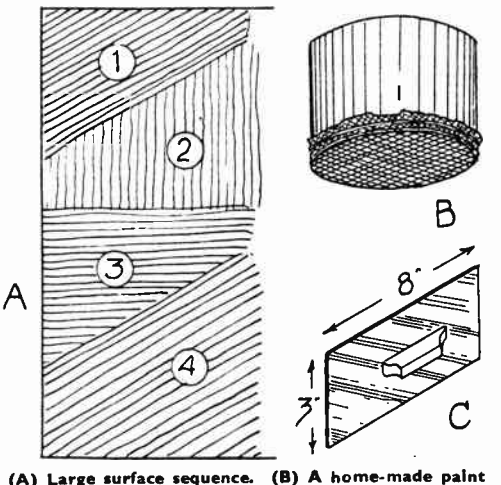
Painting a broad surface, a large panel, for example, the brush strokes should first be vertical, or the way of the grain, then across, then vertical again, to spread the colour evenly. Painting skirting boards and such other parts where the paint is likely to overstep the mark, as it were on to unwanted territory, employ a shield such as a rectangle of zinc or tin, provided with a wood handle, which can be laid touching the edge of the wood and so protect the wall. This is useful, also, to protect glass panes when painting the windows.

Sequence of Work

A routine of procedure should be adopted when painting windows and doors. Windows, for instance. First draw down the outer sash and paint the sides, then the sash bars and mouldings, following with the top and bottom bars, and finishing with the sides of the frame. The inner sash frame can then be done, finishing with the beading and window surround.

Painting a door. Do the panels first, then the mouldings. Follow with the muntins and cross rails, and finish with the stiles and edges. Leave both windows and doors partly open until the paint is hard. Use a narrow ½in. brush for mouldings, a 1½in. one for bars and stiles, and a 2in. one for panels. Brushes of the flat type suit the amateur better than any, and those with their bristles embedded in rubber are about the best. Keep a look-out for loose bristles, and soak a brush, when new, for a short time before using it for work.

Good work cannot be done with a brush whose bristles are clogged up with old paint. After use, remove as much paint as possible by rubbing the brush over a piece of old wood, then wash it in turpentine or paraffin oil. Keep it in a jar, with enough paraffin oil to cover the bristles, if wanted again shortly. It is a good plan to keep all brushes of the painting variety in a jar with a little water in it, as it prevents the bristles hardening.



(A) Large surface sequence. (B) A home-made paint strainer. (C) A handy stop for edging

For Cement or Plaster

Where paint is to be applied to cement or plaster walls, the condition of the walls must be considered. With such walls in a bad state it is a waste of time to paint, as flaking will assuredly take place. If the walls are merely damp, however, a coating of silicate of soda will be effective before the paint is applied.

The walls should receive a preliminary coat of hot size to lessen suction and the paint laid on full, and not too well brushed out, as in painting wood. If more than two coats are required, apply in the order of one flat and one glossy. An economical filling for cemented walls is a priming coat of 2lb. zinc sulphate to ½ gal. of water.

How the home handyman can undertake simple
UMBRELLA REPAIRS

IT is often so difficult nowadays to get an umbrella repaired or re-covered, that it is as well to know how to undertake the job oneself. Actually, there is nothing very difficult in the work, as it does not call for any specialized skill; a good handyman should be able to carry out the job in a satisfactory manner.

Suppose, for example, that a rib of the frame has become broken; if use can be made of any old frame of the same size, one of its ribs can be detached and used in place of the broken one. Fitting is not difficult. If the cover is taken off, it will be seen that the ribs are hinged to the bottom ring with a steel wire, running round in a groove, and twisted at its ends. If gently untwisted with the pliers, the broken rib can be slid off, and the fresh one threaded on in its place, and the wire retwisted as before. Similarly, a broken stretcher can be replaced on the sliding ring, should one be broken.

The stretchers are riveted to the ribs, and sometimes a rivet snaps and the parts separate. A fresh rivet can be made from a shoemaker's brad, cut to the correct length. It is pushed through the joint and, the head being supported on a piece of metal, burred over with light blows of a hammer. Take the opportunity to wipe off any accumulated rust on the joints and wipe over with an oily rag. Leave no superfluous oil behind, or it will stain the cover.

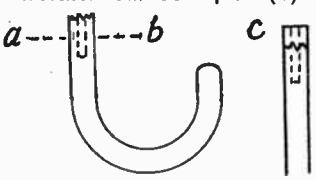


Fig. 1—A broken handle repair

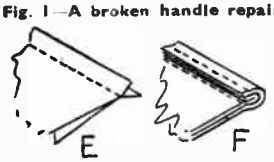


Fig. 3—Sewing the sections

Broken Handles

Apart from re-covering, which strictly speaking, is scarcely a repair in the sense usually understood, the detachment or breaking of the handle is about the only other job the handyman may be called to perform.

When the handle is a separate part, the joint is usually a dowelled one. In this case it is generally just a job of regluing together again. If the dowel is broken, however, the old parts of the dowel must be removed somehow before a new one can be fitted in.

Fitting Dowel

About the simplest way to do this rather troublesome job is to drill a hole, a little smaller than the dowel, down the centre of it, then the thin shell can be picked out with a sharp pointed instrument, leaving a clean hole for insertion of the new one. When, as sometimes happens, the handle is broken off, having formed part of the stick, such dowelling is a touchy piece of work unless treated with care and patience. A good method of tackling this is as follows.

First bore a hole down the middle of the handle portion, as in Fig. 1, making it 1in. deep or a little more, if necessary. At about ¼in. down from the break, on line (a-b), saw across the stick with the finest saw you possess. Take the sawn-off piece (C) and glue it to the stick, not the handle, making sure it is replaced exactly where the fracture shows.

Let the glue set hard, then, with the drill bit in the hole in (C), continue the hole into the stick for another ¼in. Cut a wood dowel to fit and make it ⅛in. shorter in length than the total length of the holes in both stick and handle, and glue in. Such a joint will scarcely show if well done, and be quite strong enough for satisfactory wear.

Cover Pieces

Re-covering an umbrella is quite simple, if the new cover is the correct size. This is measured in inches, along the whole length of the ribs. The old cover being stripped off, the new one is drawn over the ferrule until it rests on the bottom ring.

Shift it round until the seams of the cover are in line with the ribs of the frame, and fasten it with thread to the tops of the ribs, and twice more down the inside, one about 6in. down, and the other just below the joint of the stretchers. Pass the thread through the hems only, not the outer cover, so that the stitches are invisible from the outside.

There may be some difficulty in buying a new cover nowadays. If this happens, it is no difficult job to make a new cover oneself, if a suitable material, such as silk or black taffeta can be bought, and the necessary sewing carried out. The first thing is to make a pattern of the eight segments in a tough brown or cartridge paper (see Fig. 2).

Paper Shapes

To do this, measure the length of the ribs, and on the paper, draw a line (AB) the same length. At right angles to (AB), draw (BC) the same length, and connect points (AC) together. From point (A) and with distance (AB), mark off point (D) on line (AC).

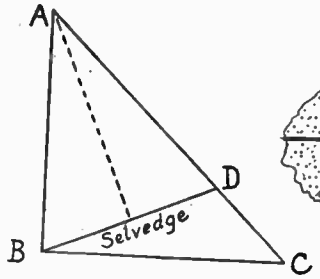


Fig. 2—Shape of cover segments

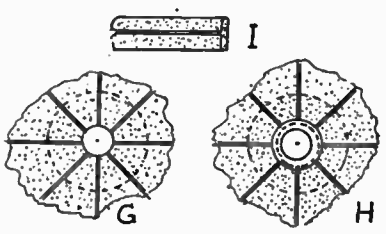


Fig. 4—Details at ferrule point

Connect (BD) and use shape (ABD) as the required pattern. Cut it out, lay on the material with line (BD) touching the selvage, and cut the material to the shape, allowing a ¼in. each side for subsequent hemming. The width of the material required will be measured along the dotted line from the selvage to point (A).

Sewing for Strength

Sew all eight sections together, as at (E), in Fig. 3, then double the ¼in. hems, as at (F) and sew through again. The thickness of the material, shown at (F) is, of course, grossly exaggerated, for clearness.

A small hole should be left in the centre, just large enough to pass the ferrule and no more, as at (G), Fig. 4. Cut a 2½in. circle of the material, and lay this underneath. Cut a similar hole in this, then with a short piece of black tape, or a 1in. wide strip of the material itself, folded over as at (I), bind the middle hole, the finished job being as at (H).

The new cover can now be fitted on the frame as previously described, and should, if correctly measured, cut out, and sewn, prove a satisfactory job.

Money is saved and reproduction improved in radio by MENDING COMPONENTS

MOST radio constructors have an accumulation of parts which will not work and appear useless. Headphones, loudspeakers and transformers are particularly liable to breakage because they are wound with very fine wire and a momentary short-circuit or wrong connection may burn the winding through. However, it is usually fairly easy to remedy this and the parts should then be as good as new and give many years service.

Phones and Speakers

When a pair of phones which will not work are to hand, the flexible leads should first be examined. The phones should click loudly when connected to a small 1·5 volt dry cell. By trying the cell on the usual tags, and on the phone terminals themselves, any break in the leads will be disclosed. If they are faulty, a length of twin flex can be obtained and fitted in place of the defective leads.

The two earphones are often connected in series, so a break in one will prevent both working. If one phone clicks when the battery is connected to the earpiece itself, it is in order and the other earpiece should receive attention.

Upon unscrewing the cover and lifting off the diaphragm the bobbins will be disclosed (see Fig. 1). Sometimes one of the small leads which connect the two bobbins, or go from bobbins to terminals, may be broken loose. If so, re-soldering it in place will put the phone in order. If there is no break here, one of the bobbin windings is fractured (it is very unusual for *both* to break).

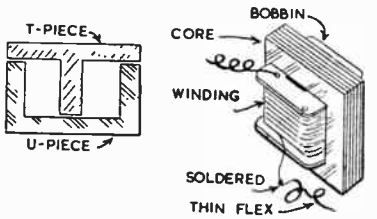


Fig. 2—Repair of transformers, etc.

To find which bobbin is at fault, connect a small piece of wire from the junction of the bobbin windings to one terminal, replace the diaphragm and try with a battery. When the faulty winding is thus shorted, the phone will click loudly.

Actually, many phones give excellent results with one bobbin shorted, and this offers a simple way of mending the phone earpiece which is at fault. It is also possible to re-wind the bobbin (see instructions later), and to do this the terminals should be unscrewed and the magnet and bobbins lifted from the case.

With some earphones the leads disappear through a hole in the case. Here they will be held by small screw terminals placed inside. Many older type speakers can be treated in the same way.

Cone Speakers

Fig. 1 also shows a cone speaker, and this should click loudly when connected to a small dry cell. If it does not, examine the leads and connections. If there is no fault in these, the winding is fractured and should be repaired as will be described.

It is also essential the armature should not foul the end of the bobbin magnet and the adjusting screw provided may be

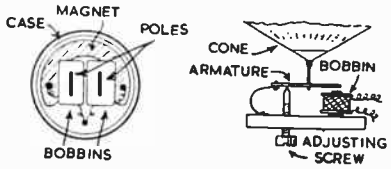


Fig. 1—Phones and moving iron speakers

altered to ensure this is not causing the trouble. Also clean out the gap between the magnet and armature. For proper results a speaker should be fixed in a cabinet or secured to a baffle-board—a flat board with suitable hole for the speaker.

Transformers and Chokes

By using phones and a small battery the continuity of windings can be tested. If a winding is broken, the transformer itself should be removed from its case—this is usually easy and cheap—transformers will merely have fixing feet, and not be enclosed.

The bobbin and core will be as shown in Fig. 2, and all the core stampings must be removed. These are either T- and U-shaped pieces, inserted alternately from each end of the bobbin, or W-and I-shaped pieces. After they are removed, the bobbin can be unwound. After re-winding, all the stampings should be replaced just as they were before removal.

With high frequency chokes there will usually be no iron core to remove and fewer turns on a slotted former will be used, and the re-winding will, therefore, be much easier.

Unwinding the Bobbin

Whatever type of component is in view, it is usually easiest to unwind the wire, solder the break, and re-wind. This saves having to make a new bobbin or purchase wire of the required gauge. First of all, carefully examine the visible ends to assure the break is not here. If it is, it can be mended without unwinding the bobbin.

If no break is visible, pull off the insulating tape or paper to disclose the winding. Because the windings themselves are of very thin wire the ends are usually soldered to thin flex, which is brought out through holes in the bobbin cheeks. There is a fair chance that the joint between winding and flex on the outside of the bobbin has broken, because heating weakens the wire. If so, mend the fracture without unwinding.

If no break is visible here, the bobbin will have to be unwound until the break is found. To do this, clamp or wedge the bobbin on an axle so that it can turn freely and wind off the wire on to a large cotton-reel or something similar. (Operations will be speeded up if the reel is fixed to a short rod held in a geared hand-drill).

When the break is found, carefully scrape the ends of the wire and twist together for an inch or so. Then apply flux and a trace of solder on a clean, hot iron, and fold a piece of paper over the joint. Afterwards, wind all the turns back on the bobbin.

Tuning Coils and Condensers

Occasionally tuning coils cease to work because of broken windings and it will usually be found that the fault is at a terminal or other junction. Or misuse may have caused one of the strands to be cut on some sharp object.

Such breaks can be located with the phone and battery test, and may be soldered easily. If necessary, a short length of new thin wire may be used to make the break good. Re-winding is not likely to be necessary.

Variable condensers are particularly

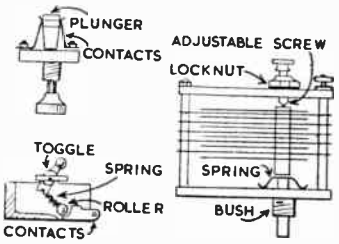


Fig. 3—Variable condensers and switches

liable to damage from rough handling as there are many plates, close together, which must not touch.

If the plates are visibly bent the first thing to do is to straighten them out very carefully. They should be flat and turn without wobble. Normally, a spring pushes the moving plates towards the back of the condenser, and an adjustable screw (see Fig. 3), enables the spacing to be set so that moving and fixed plates do not foul each other. If the spring is weak so that the plates are not held in position bend it slightly, then loosen the locknut and adjust the spacing as described.

The frame of the condenser should be solid, so assure the other nuts, etc., are tight, so that the plates cannot wobble. A few condensers have an arrangement whereby the spacing is adjusted by turning the fixing bush, and these are treated in the same way.

Add to your winter comfort by making this folding

FIRESIDE CHAIR-TABLE

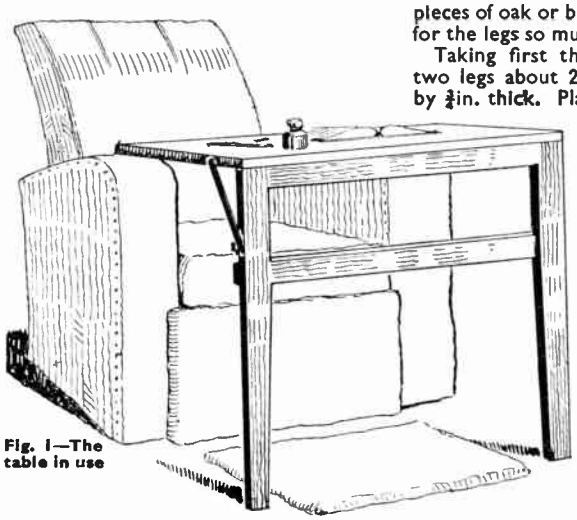


Fig. 1—The table in use

HERE is the real luxury work-table, one that can be used in the winter evenings near the fire. The student and craftsman would find one of these most useful, and when work is done, the two halves or leaves of the table fold together compact and convenient. The table is light in weight and in construction, being made of two frames hinged together and stood upon the easy chair, as our illustration, Fig. 1.

We have here taken the almost standard type of easy chair as a good example for our measurements. In Figs. 2 and 3 is a side view and a front view respectively of such a chair with the table shown erected ready for use. We have shown certain measurements, but the worker is advised to measure his own chair.

The height of the table will, of course, be governed by the height of the chair arms, as will be apparent from Fig. 2. Deal is quite suitable to use, but if two pieces of oak or beech could be procured for the legs so much the better.

Taking first the leg frame we want two legs about 22in. long by 2in. wide by ¾in. thick. Plane these up and taper them from the middle cross rail downwards to lighten the effect. The ends of the top and middle rails are thus kept square and more easily worked. Notice that the taper is on the inside of the leg only.

The diagram at Fig. 4 shows at a glance the construction of the leg frame. Now the top rail is simply halved to the tops of the legs, while the middle rail is let in. This latter rail could, so as not to weaken the legs, be let in, say, ¼in. instead of ⅜in.

All the halving joints should be carefully marked first and then cut in with a fine-tooth tenon saw. The joints must be made clean and the touching surface made level and flat to get a really strong glued joint. Dowel pins of hardwood might be driven in or countersunk screws run in and levelled up neatly.

The top frame is again of light construction and consists of the five rails all halved together, as Fig. 5 shows. Here also 2in. by ¾in. wood may be used or even a lighter section adopted, say, 1½in. by ⅝in. according to the top covering chosen. Take care to get the angles quite square by checking them with a try-square or set-square.

The main top can consist of fibre board or a sheet of plywood if this can be obtained. Glue the covering to the frame and run in a few screws as secure fixing. There are three ways of finishing off the table top.

Cloth Covering

The whole may be covered with rexine or green baize turned over at the edges and tacked underneath. Or a definite wood edging made as either of the two schemes, shown in Fig. 6. In one, the top covering is cut short of the framing and a wood rounded-top beading nailed and glued round. Alternatively the top covering is left flush with the edge of the framing and a wide batten screwed on to cover the joint. The latter makes by far the better and more substantial edging.

To hold the table top in place between the arms of the chair so it shall not slip sideways, two small blocks of wood are screwed on underneath. The two frames are joined with a pair of stout brass hinges which will allow them to be folded down one upon the other.

To hold the legs steady when the table is erected some such contrivance could be made, as shown in the side view, Fig. 2, and in detail, Fig. 7. A strip of metal of stout gauge is shaped, as shown, and one end screwed to the edge of the table. The loose end is slotted, this slot engaging with a threaded pin which is driven into the leg. The pin at the outer end is fitted with a wing nut and washer.

When erecting the table top, the legs are carried down at right angles until the hinges hold the two squarely. The metal strips are then brought down to engage the leg pin, the washers slipped over and the wing nut put on and tightened up.

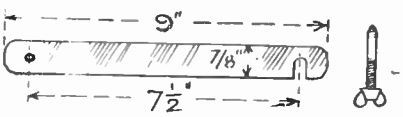


Fig. 7—The metal holder with screw

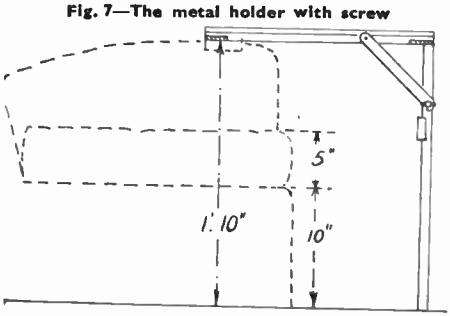


Fig. 2—Side view with chair arm dotted

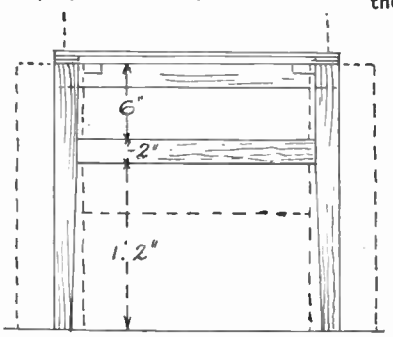


Fig. 3—Front view of table

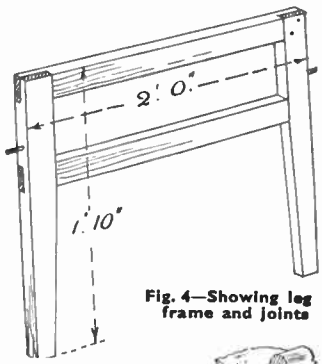


Fig. 4—Showing leg frame and joints

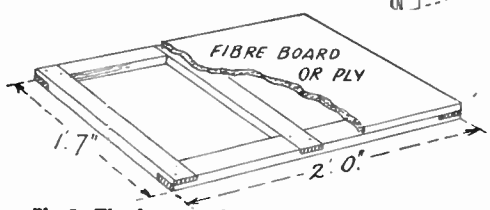


Fig. 5—The frame and tray portion of the table

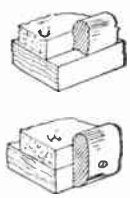


Fig. 6—Edging to table

Amuse your friends by learning a little simple

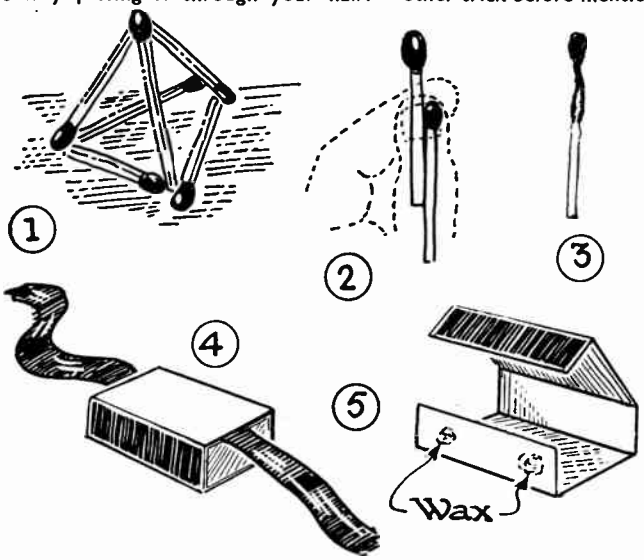
MATCH CONJURING

EVERYONE likes to do a few conjuring tricks—not elaborate affairs, perhaps—that is the province of the man who has made magic his hobby or vocation—but little 'wheezes' that will entertain the company and provide a pleasant diversion, without an excessive amount of apparatus or preparation.

The chief items are matches, so to introduce the subject, try the usual type of match trick. For example, ask if anyone can make four equal triangles with six matches. Simple when you know. Make a pyramid of them, as shown.

Waterproof

Then say 'Marvellous matches, these!' Dip the head of one in a glass of water. Make mysterious signs with it, incidentally passing it through your hair.



Then strike it on the box. In spite of its dousing, the match lights up.

There is no trick. It's just an old camper's idea. The passing of the match through the dry hair does it. Try this on your own hair to make sure it works with you. Test how far and for how long, the match can be wetted.

You then pick up the spent match, which is charred, of course, at the end. Point to the fact that it *is* spent. Yet when you strike it on the box, it lights up!

Preparation

Clever deception here! The match you pick up (from an ash tray) is not the one you threw down, but a faked match you 'planted' in readiness. Take a match, and, using a spent match as a model, carve away some of the wood, leaving the head intact. Then dip in Indian Ink to make the head black (Fig. 3). At the other end, make some secret mark so you can identify this particular match.

It will, of course, look just like a spent one, whereas it still has the head intact. Prepare several matches like this, in advance. Do not make an ass of yourself by thinking of this stunt at the last minute and just dipping matches in blue-black writing ink. This would not even fool Aunt Annie with her glasses off.

Double Strike

Here is a variation of this stunt. Hold two matches as shown (Fig. 2), so the head of one shows. Strike this. Blow out. Then push the other head up and apparently strike the same match twice. Most people will see through this, as the whole thing is just a catch. It is as well to do this first and then baffle them by the other trick before mentioned.

You can then let someone else 'have a go' (with ordinary, unprepared matches). Explain that these matches strike twice. Someone will try it and, of course, fail. You can then explain that you can *strike* them any number of times, but they only *light up* once!

And now for some real conjuring again. Show a length of ribbon. Lay it over the tray of a matchbox (preferably empty) and then replace the cover, so the position is as shown (Fig. 4). Slide the matchbox up and down the ribbon, two spectators each having taken an end.

Cover the box with a handkerchief, and mutter the mystic words. Place your hand under the handkerchief and remove the box. The ribbon is intact.

A fake matchbox is required. The illustration (Fig. 5) shows this so well that little extra comment is needed. The flap is kept in place with some dabs of soft wax ('Melrose' for example). Under cover of the handkerchief, the flap is lifted, the whole box taken off the ribbon, and the flap resealed. The ribbon is, of course, much larger than that shown in Fig. 4 whilst, in Fig. 5, only the cover is shown, for clearness.

Pocket the matchbox after showing it casually to the spectators. A good excuse for pocketing it is so the handkerchief can be removed. This is twirled into a rope between the hands and then held vertically between them. The top hand is then removed and the handkerchief stands on end, like the celebrated Indian Rope Trick. The performer can whistle a few bars of the Snake Charmer music from *In a Persian Market*. The handkerchief is then crushed up and then opened to show that nothing is concealed in it to account for its uncanny stiffness.

Yet there *was* something in it: a piece of white plastic wire inserted in the hem on one side. Do this and then get practising.

Replace your handkerchief and produce an empty matchbox tray. Ask someone to place a sixpence on the table and to cover it with the tray. Then offer to extract the sixpence without touching the box.

You make mysterious passes over it and reach under the table. Here you make peculiar scratching noises and finally produce a sixpence. Actually it is a spare one you have already in your hand. But there is certain to be someone (who has not been caught with this before) who will raise the matchbox lid to see whether *his* coin has really vanished. As soon as he does this, you reach out and extract the sixpence. You have then fulfilled your promise—you have not touched the box!

Card Tricks

Now what about a trick with some cards? Ask someone to shuffle the pack, cut it and then deal off as many cards as there are letters in his surname. This is actually a lot of bluff as it does not make any difference how many cards are dealt. Though a name like Robinson is best, as it gives a fair number of cards.

Fan out the cards and ask someone to choose one. Without looking at it yourself, hold it up to show to the company 'so that they will recognize it if they see it again'. As you do so, however, dig your thumb nail into one corner to give it a slight mark by which you can identify it under a good light as the cards are laid down. Return the card to the packet of eight, or whatever the number is, and get someone to shuffle them. Then lay them out, face down in some irregular pattern, noting where the marked card is by the tiny mark at the corner.

Then ask your assistant how many letters there are in his first Christian name. Suppose it is James—5 letters. Count 1—2—3—4—5, each time pointing to a different card, but at the fifth, alighting on the chosen card. Turn this up and show that such is the case.

As just mentioned, all this business of the number of letters in the name is just eyewash, but it is this dressing up of tricks that makes them so effective.

MISCELLANEOUS ADVERTISEMENTS

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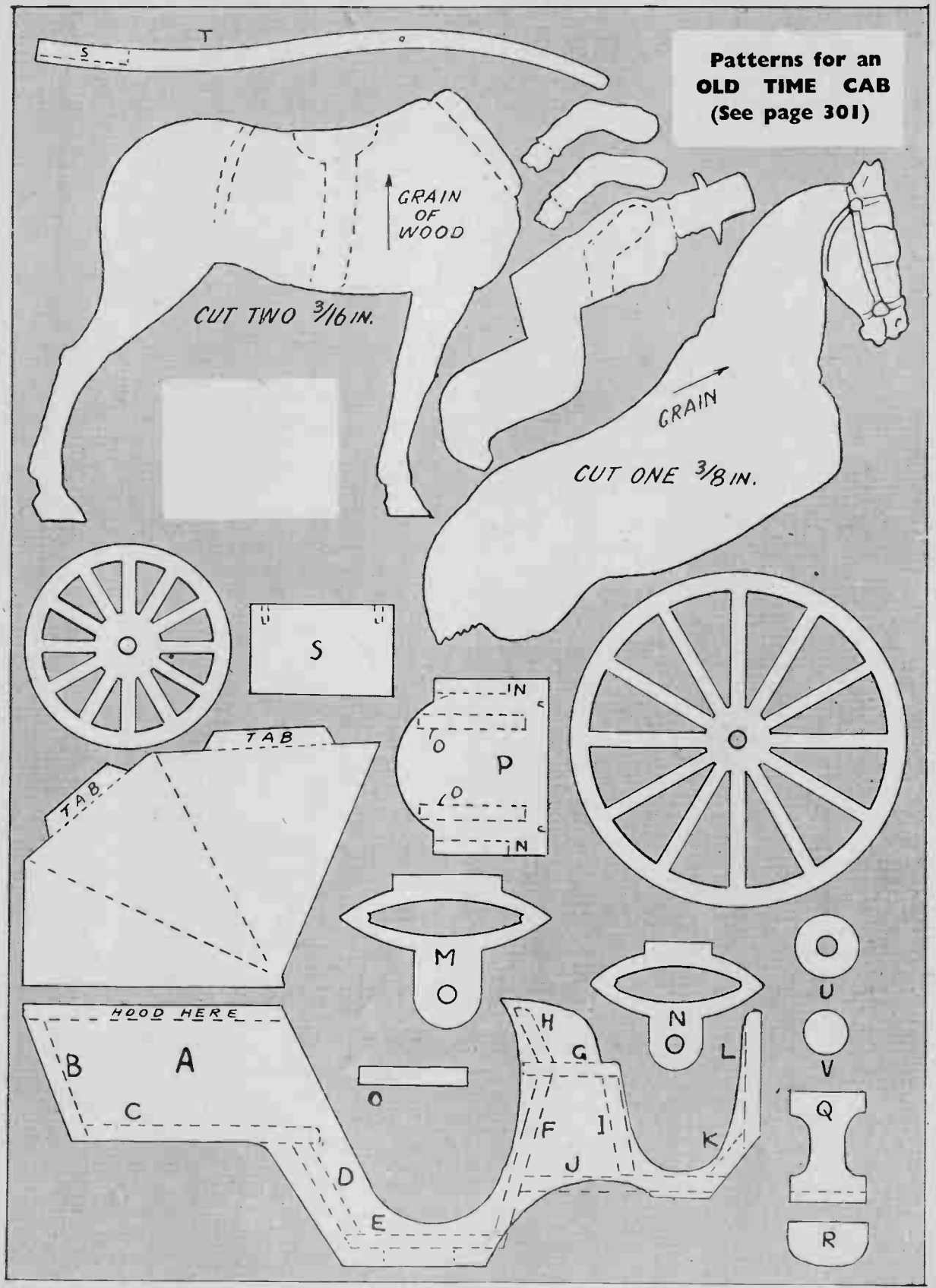

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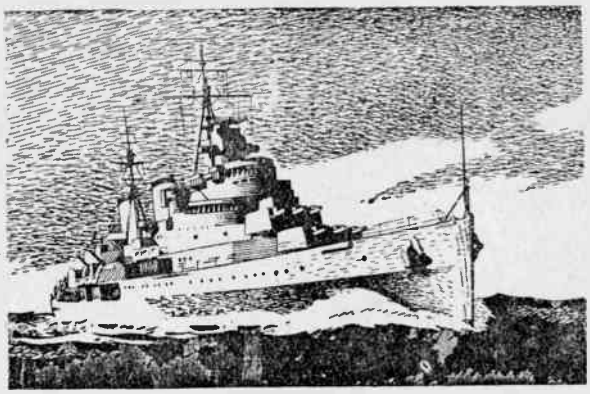

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